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INFORMATION REPORT INFORMATION REPORT

CENTRAL INTELLIGENCE AGENCY 25X1

S-E-C-R-E-T

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ZEISS Group

19. This group worked on an electromagnetic stabilization device for power packs of the order of 10 Kw. output. They also did some work on ultra-sonic generators of large power; this work was theoretical and the Germans were unable to discover from the Russians in what media the ultra-sonic emission was to be propagated; the " magneto-striction " principle was employed. The German KORTUM, was working on this device. An ultra-sonic filter, which he claimed to have developed himself, was subsequently found to have been based on the description of a similar item which appeared in a U.S.A. magazine. 25X1

20. Another task given to the group in this period was the construction of an astronomical reflecting telescope using a 2½-meter diameter mirror. This work was carried out by Dr. KUHNE (?) of Zeiss and PFAFF, now in Jena. They also worked on an automatic device for control of this telescope to follow a star, thus permitting photographs to be taken over a long period of time.

Other Information

21. *Security.*—Secret papers, including the Germans' own working papers, were kept in sealed portfolios and had to be taken out from security store and returned each half-day—morning and afternoon. Papers had to be listed and this was sometimes checked. Papers could not be taken out of the institute. [redacted] 25X1

[redacted] 25X1

23. *Influx of Personnel.*—The members of the Russian group which came to the Island in 1951 to familiarise themselves with the work, with a view to taking over, were almost all young engineers apparently straight from Technical School. [redacted] 25X1

GUIDED WEAPON PROJECTS

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(*a*) *Ballistics of the Warhead.*

Four types of warhead were designed for experiments with the A–4 rocket. They were to be separable and space was allowed for the carriage in the warhead of telemetering equipment and measuring instruments. The experimental firings were intended to provide data on separation and behaviour of the warhead after fuel cut off, on stability and acceleration, and on heating at re-entry. One or more of the heads was to be of wood or to have a wooden liner, the intention being to measure the amount of burning which took place in the terminal part of the trajectory.

Some waterchannel experiments were carried out in order to obtain aerodynamic data on the separation of warheads as a general problem.

(*b*) *Constructional Investigations.*

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(i) Some motors were got ready at NII. 88 for static tests which were done on the Island. These were of the original A–4 type. The tests were intended to be part of the constructional proving programme.

(ii) A series of tests were drawn up to prove the whole rocket body. A typical item in this series was the test intended to obtain data on pre-launch cooling. Full-scale models of parts of the rocket were also made at NII. 88.

(iii) A series of firing tests were proposed. These were to be carried out using the R–10 design of body but with an A–4 motor modified (shortened and with increased fuel flow) to suit the R–10 requirements. The motor was to give 32 ton (32000 Kg) thrust but a separate gas generator was to be used (*i.e.*, no gas bleed from combustion chamber to turbines). There was to be no change in the cooling arrangements.

(iv) A programme of tests was proposed for such items as handling, fueling, loading, on trucks, &c. A modified form of transporter was proposed.

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31. *Warhead.*—There were two warheads proposals. That proposed by the Germans was to be of wood, but the Russians asked for a design in steel.

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the designs called for a wall thickness of 40 mm. for the wooden warhead and for 20 mm. plus some insulating liner in the case of the steel warhead. Both were cylindrical and separable, and on separation, the front fairing cone was to be blown off in both cases. The weight of explosive was to be adjusted so that the total weight of head would be the same in the two cases. Since, for the form of warhead proposed, the velocity at impact would be only a few hundred metres per second, the question of a kinetic energy contribution does not arise.

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at one time ALBRING had considered designing a warhead which would provide for a laminar flow so as to increase speed. (It is not clear whether this was for the R–10 or the R–14.) The possibility of cooling the warhead by means of water or other liquid was also considered, but no work was done on this.

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33. *Guidance.*—There was to have been no essential difference between the system used for the R–10 and that used for the R–14, except that owing to the height of the R–14 trajectory, the Germans were aware of the possibility of difficulties in radio propagation through the upper layers of the atmosphere. The actual guidance aerials were to have been located in the rim of the rear skirt but

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the final positioning of these would have been a matter for decision at a later stage.

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R–15 Project

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36. *Guidance.*— some radio control was necessary to the R–15 but it would prove a very difficult problem. This view was also expressed to ALBRING by PREIKSCHAT. Small conferences were held to discuss the guidance question and other points at which only Germans were present. There were, however, conferences with Russians (unknown) who visited the Island to discuss the R–15. The use of clandestine transmitters was an old Peenemünde idea, but of little use to the A–4 (or R–10). This idea may have been revived in talks on the R–15 which was more suitable for this type of guidance. The idea might have been included in the R–15 reports sent to Moscow.

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R–10 Control System (fig. 8. 25X1

52. The gyroscopic stabilising system to be employed in the R–10 project did not differ basically from that of the A–4.

53. Fig. 8 shows an edited version of the rough sketch 25X1
25X1
Small gyroscopes which have previously been variously described as "electrically tied turn indicators," "electrical spring rate gyroscopes" and "mixing gyroscopes" are employed to measure rates of change in the angles of missile pitch, yaw and roll. The gyros are electro-magnetically restrained by suitable field windings. Voltages proportional to instantaneous position of the gyro axes are picked off small centre tapped potentiometers and these outputs are integrated through RC networks. The outputs for each axis are fed into a mixing unit thus giving rough values of heading plus rate of change of heading in the pitch and yaw signals. The rate gyroscope is considered adequate for roll stabilisation as it is estimated that an error in roll of up to 10° is tolerable before any significant steering error develops.

54. The pitch and yaw gyro field windings are arranged to receive input command signals from a programme rotary time switch for about twenty seconds after firing. This programme steers the missile into the fixed "axis" of the ground receiver antennæ array. The ground command system then takes over and command signals are fed to the two gyroscopes via the airborne receiver. Command signals (at a different level) are likewise fed to the mixing unit, first by the programme switch and later by the airborne receiver.

55. The only items which are new in the above arrangements as compared with the A–4 are the small ("MARKGRAF") gyroscopes and the capacity integrating networks. The essential difference between the system described and that for the A–4 rocket is that in this case the accuracy of steering is dependent on the command control guidance system; the gyroscopes' function is solely the maintenance of missile stability.

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56. The facility for altering the R–10 control constants as altitude varies was not in fact included in the German design. if such a facility should be required it could easily be incorporated. , for example, potentiometers in the field winding circuits of the azimuth and elevation gyroscopes. These potentiometers could be programmed to vary the control constants appropriately as altitude changed. 25X1 25X1

57. Five sets of the gyroscope units for R–10 control were built. These were intended for test in A–4 rockets after Bahnmodell experiments had been completed. At the time, since the radio system was not then completed, the gyro units were to have been arranged as for the old A–4 system, the radio units being incorporated later. In fact, no actual experiments were done by the Germans.

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[redacted] 25X1

F.—Materials and Materials Testing

82. GOST standards were used throughout all work [redacted] 25X1
[redacted] Some materials were very good, some bad, but standards were for the 25X1
most part maintain[redacted] adhesives, paints and bakelites as being 25X1
generally of a high quality and when questioned specifically on these, cited QUESSEL'S work on an electro magnetic clutch (paragraph 7). The adhesive used in assembling the laminated steel core was prepared by mixing two constituents, was black in colour and very strong. A universal adhesive in general use was KL 3 or 4 (or, perhaps KF 3 or 4). It was plastic-based and yellowish in colour. An organic solution similar to shellac was also in use as an adhesive.

83. [redacted] the Germans had discussions 25X1
with the Russians on the use of special materials. For example, IORDANSKIY and another Russian (KISILEV) were interested in the development of a corrosion resistant steel suitable for use in, say, fuel line valves.

84. At both Bleicherode and Soemmerda, the Germans had discussed among themselves the possibility of using wood in rocket construction. [redacted] 25X1
25X1

[redacted]

[redacted] 25X1

90. In 1946–47, FERCHLAND did some work on a project for a missile testing laboratory. This project was to include provision for a vibration testing gear suitable for testing vibrations in the frequency spectrum 0 to 50 cycles, and having amplitudes of up to 2 mm. [redacted] 25X1

[redacted] 25X1

I.—General

Published Literature

91. Scientific periodicals were readily made available in the library on the Island, and Russian technical books could easily be obtained. The library was very up to date. POBEDONOSTSEV had a copy of a classified report on rockets, compiled just before the end of the war. [redacted] 25X1

[redacted] 25X1

92. Among papers published by the Institute of Automatics and Telemechanics, [redacted] papers by SOLODOVNIKOV, who was interested in problems of stability of control systems, and by TSYPKIN, who was interested in the non linear mathematics of control problems. 25X1

93. There was said to be a very large bureau in Moscow, responsible for translating foreign scientific papers. Also, translators in factories could make contracts with the bureau for translation work.

[redacted] 25X1

ORGANISATION AND ESTABLISHMENTS

Ministry of Armaments

[redacted] 25X1

the responsibility for research and development in the guidance field for example might be that of the Ministry of Communications Equipment. In this connection it may be significant that in 1951 there seemed to be a shift of emphasis to guidance work. For instance, RYAZANSKIY, previously with the Ministry of Communications, took over POBEDONOSTSEV's work at NII. 88; at the same time HOCH replaced Source as Head of the German group on the Island.

7th Chief Directorate

97. [redacted] the offices 25X1
of this Directorate were located in a large building on Gorki Street, [redacted]
[redacted] identified from the German V1-41 map of the Moscow area as being the 25X1
Ministry of Armament building. [redacted] 25X1
[redacted] KURGANOV is believed to have succeeded
SPIRIDONOV as Chief Engineer of the Directorate. [redacted] the 25X1
Directorate was responsible for research and development, [redacted] possible 25X1
that it would also cover large-scale production.

[redacted] 25X1

Previous mention of the " Minister's representative " is now known to have referred to the Director of the responsible Chief Directorate—in this case the 7th. [redacted] 25X1
[redacted] 25X1

N.T.S. (Nauchnyy Tekhnicheskn Sovet)

98. *Membership.*—The only possible additional member [redacted]
[redacted] was KHARCHEV [redacted] who wore Air Force uniform. 25X1

[redacted]

100. *Functions.*—Nothing is known which might suggest that N.T.S. met elsewhere than at NII. 88. [redacted] the N.T.S. would be responsible 25X1
for all Guided Missile work and at least some unguided rockets. [redacted] 25X1
[redacted] Should this be not so then some at least might be expected to be 25X1
members of any other responsible committee. The only evidence was that all services and a number of other ministries and academies were represented on the N.T.S. While some of the NII. 88 members were believed to have been away together at given times, it did not follow that this would be for an N.T.S. Conference in some other place. [redacted] 25X1
25X1

[redacted]

POBEDONOSTSEV. Fig. 1 shows the approximate location of these on a small-scale sketch map of the Moscow area. The locations involved were:—

109. *Bolshevo.*—The " camp " was in a very large, old, pre-revolution house situated five minutes from the station; it was let to the Ministry of Armaments by the Film Ministry (photos will be made available) Fig. 2 is a rough diagram to illustrate the position relative to the railway station. 25X1

110. *Valentinovka.*— The camp consisted of old pre-revolutionary buildings, part of the property of a Soviet Ministry likened to a " Cabinet Ministry." 25X1 25X1 it was a purely residential area. 25X1 (Photos will be made available.) Fig. 3 is showing the position 25X1 of the " Soviet Ministry " building relative to the local station.

111. *Mamentovka.*--There were two separate locations here. Mamentovka 1 was occupied by German scientists from Zeiss, Jena 25X1 Mamentovka 2, formerly " The House of Mamentovka " was occupied by Germans from Bleicherode This building was, he thought, rented by 25X1 the Ministry of Armament from some other Ministry. Fig. 4 is sketch 25X1 illustrating the position relative to the railway line.

112. *Pushkino*— a small place in which only people 25X1 of minor importance were accommodated.

113. *Monino.*—This location was in a very large building. The people both lived and had their work rooms in this building; it was under the Ministry of Communications Equipment.

114. *Il'inskoye.*— 25X1 Here, the Germans lived in small houses and bungalows, rented by the Ministry of Communications. 25X1 25X1

115. *Zagorsk.*—The largest size of test stand originally planned was, 25X1 for 30 to 35 ton thrust engines. However, it is quite possible that larger 25X1 test stands were contemplated. JAFFKE and PAUER were associated in the development plans and in 1947 they visited the proposed site near a village which had in it an " old church," which was " visited by tourists." JAFFKE would not talk about it. It was " TOP SECRET." SUKHOMLINOV went 25X1 to Zagorsk.

116. *K.B.2.*— The term Konstruktsionnoe Byuro is very ordinary; such an office would exist in practically all factories, and the number would have significance only within the actual works. It could occur several times within a single Ministry, *i.e.,* at different sites. The K.B. at NII. 88 worked on the building layout for the Island.

117. *Khimki* (Engine factory).—The only work in 25X1 connection with Khimki (of which GLUSHKO was Director) was in connection with the building of a test stand for a 25–30-ton motor. 25X1 a 100-ton engine was being considered at Lehesten before the Germans were deported, and 25X1 any work on such a project which might have been carried out at Khimki 25X1 probably stemmed from this earlier work.

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120. *Airfields.*—There was a large civil airfield near Khimki or on the road to Khimki or Kalinin; it may have been on the left-hand side of the road from Moscow and there was a Metro station nearby. There was also a small military airfield somewhere along the route from the centre of Moscow to Pushkino.

121. *New Institute in Khimki Area.*—This apparently accommodated a large number of personnel among whom all Germans known to be there were specialists in some part of guidance activity. Regarding this latter fact, [redacted] it would be strange if it were not subordinate to the Ministry of Communications, since many of the Germans believed to be employed there were previously employed within that Ministry. [redacted] this new institute is a large one; the work was sufficiently important to merit the occasional award of a Stalin Prize. 25X1 25X1 25X1

[redacted]

129. *Main Administration Building.*—This was located at the side gate to the factory on the Moscow–Yaroslavl road ([redacted] the main entrance was on the other side of the factory, leading out in the direction of Kaliningrad). The building was identified as having a cupola type roof and being on the northern side of the entrance. The ground floor containing the library and conference room was reached by a flight of steps. The conference room appeared to be used by the librarians but was cleared for meetings of the N.T.S. On the floor above were the offices of GONOR and POBEDONOSTSEV. 25X1

[redacted] 25X1

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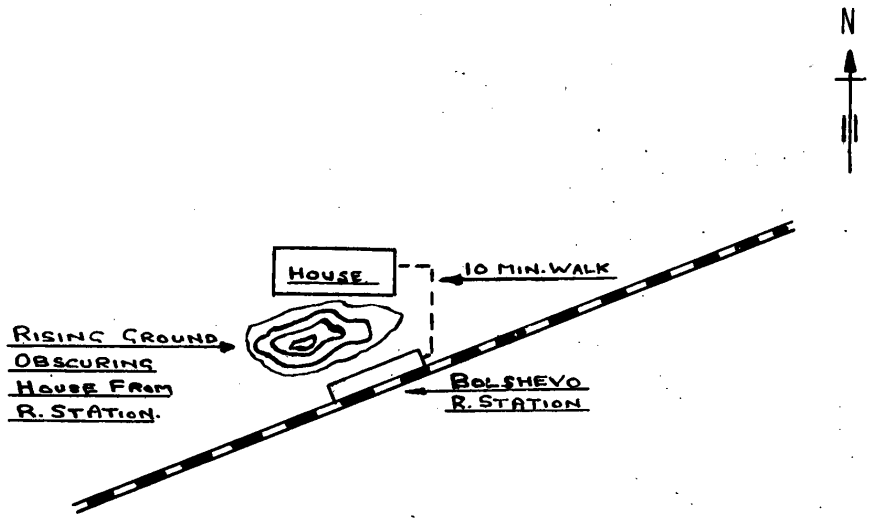


FIG2

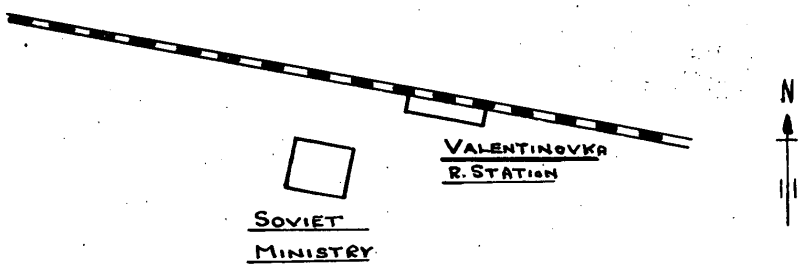


FIG3

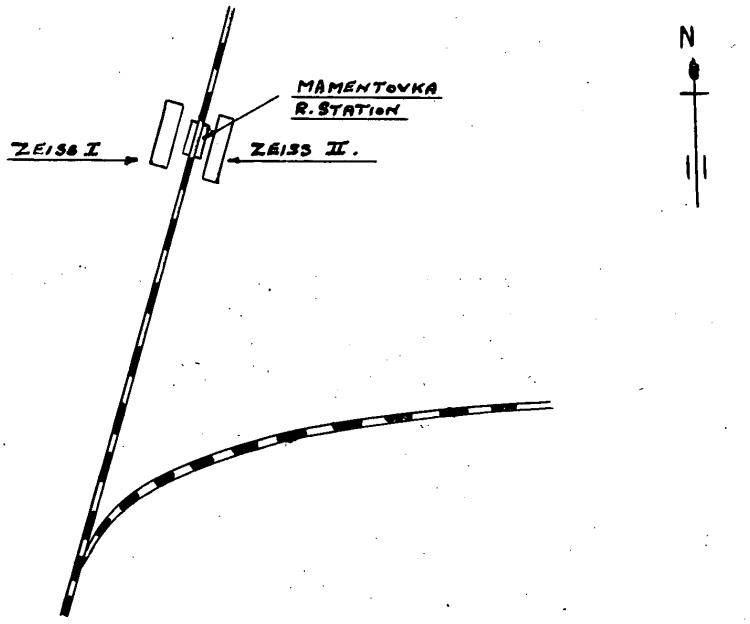


FIG 4

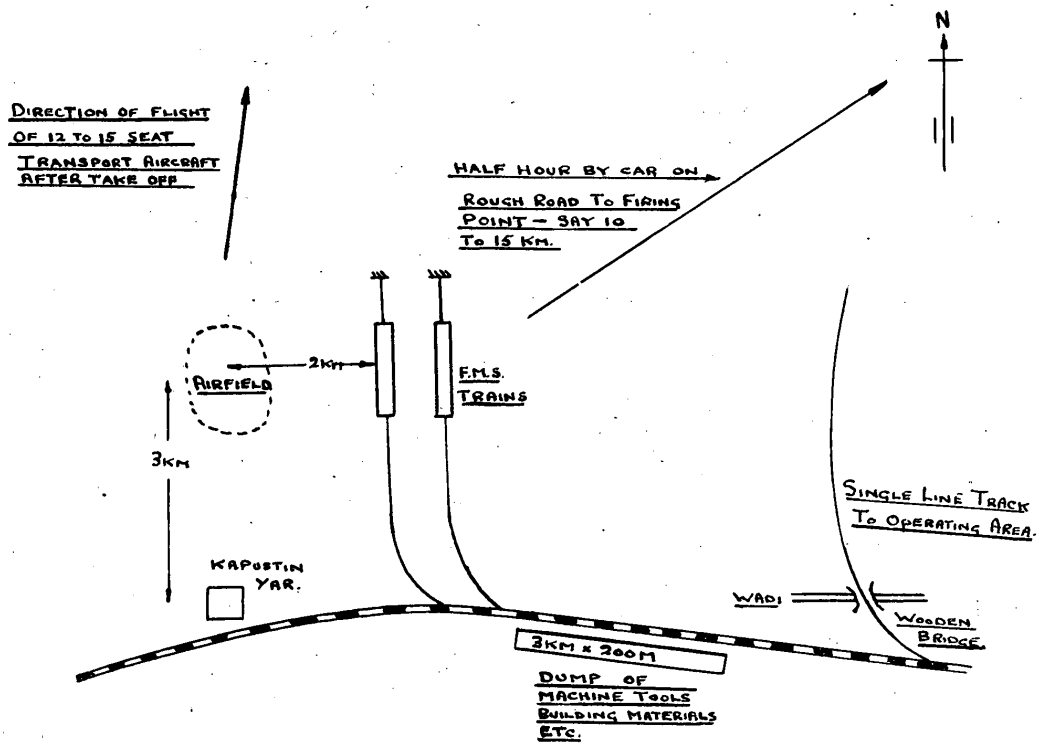


FIG 5

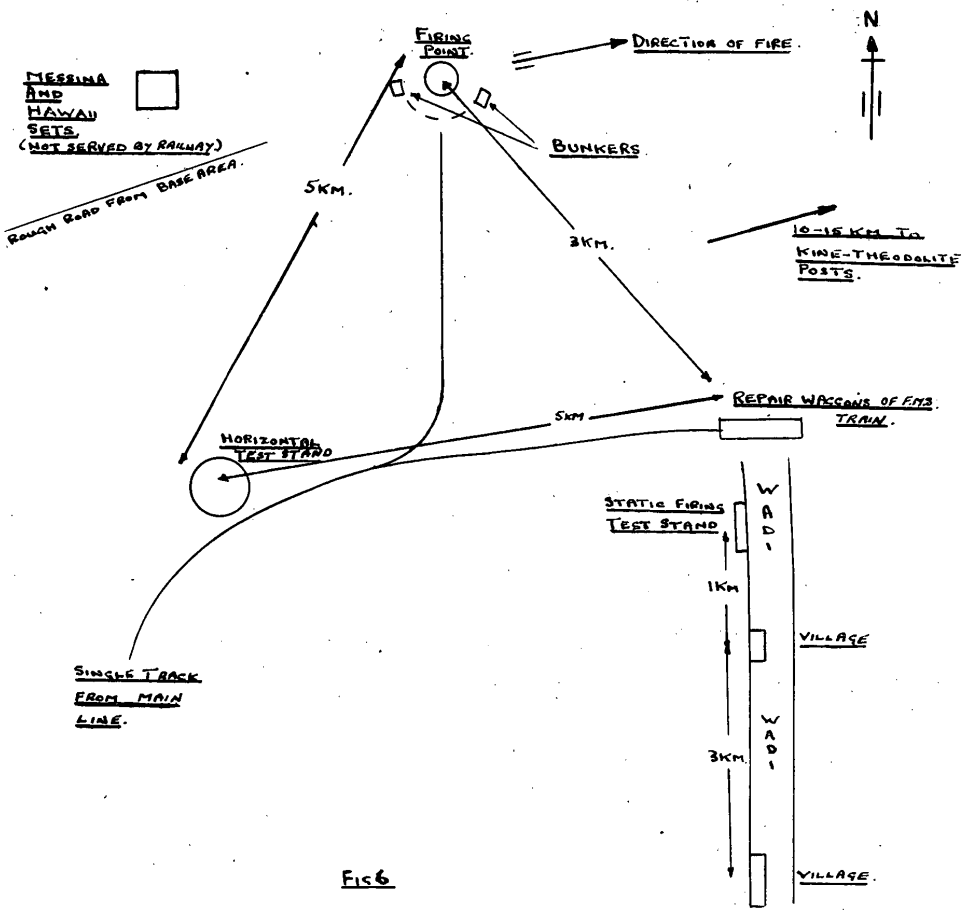
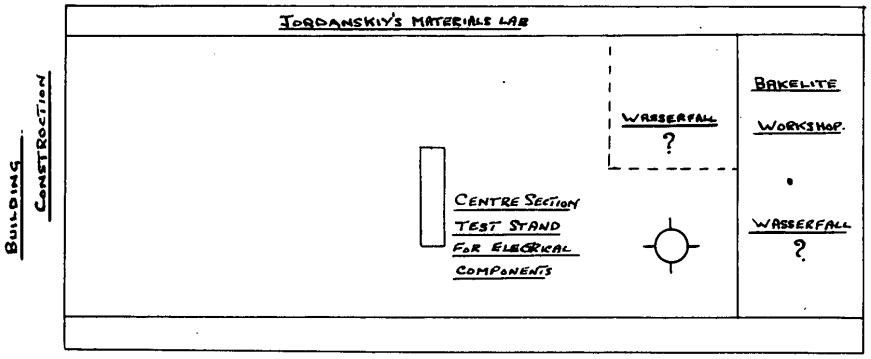
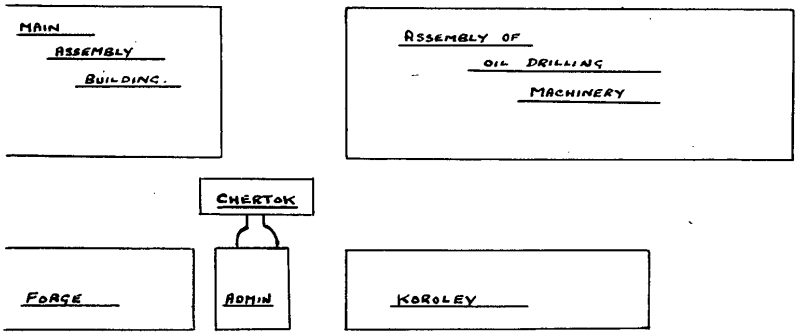


Fig 6

MAIN ASSEMBLY BUILDING.



MAIN FACTORY AREA.



ADMIN BUILDING AREA.

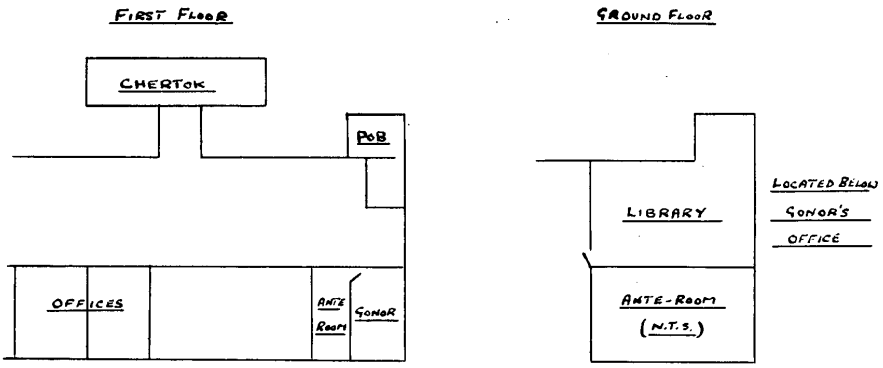


FIG. 7.

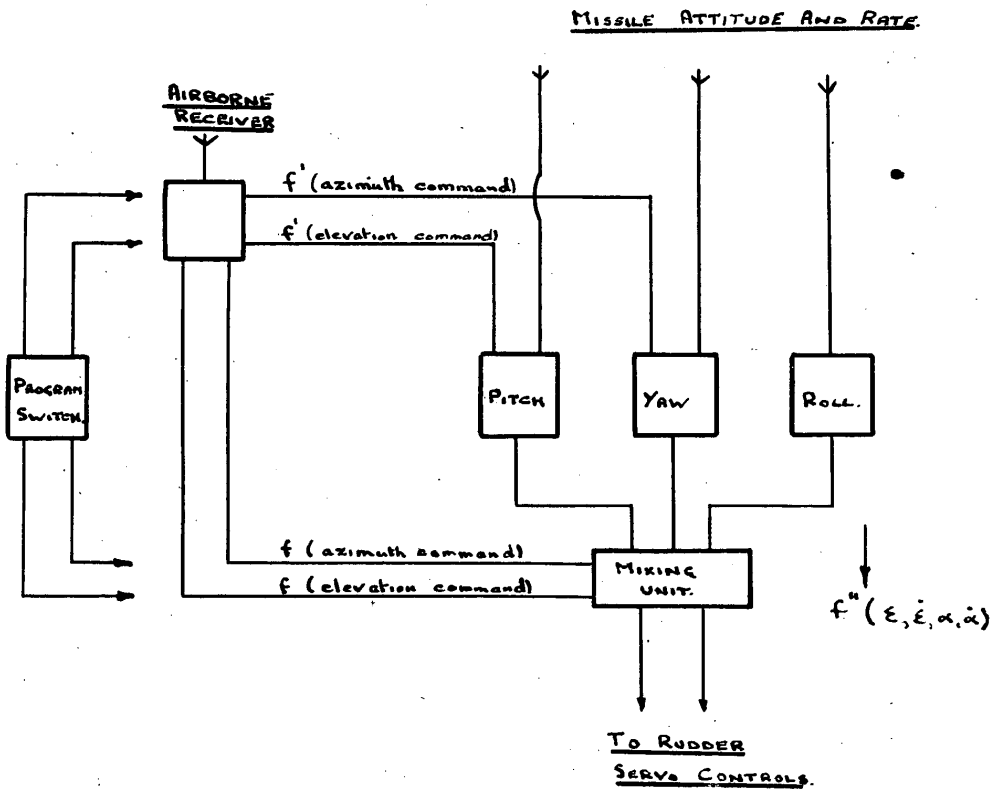
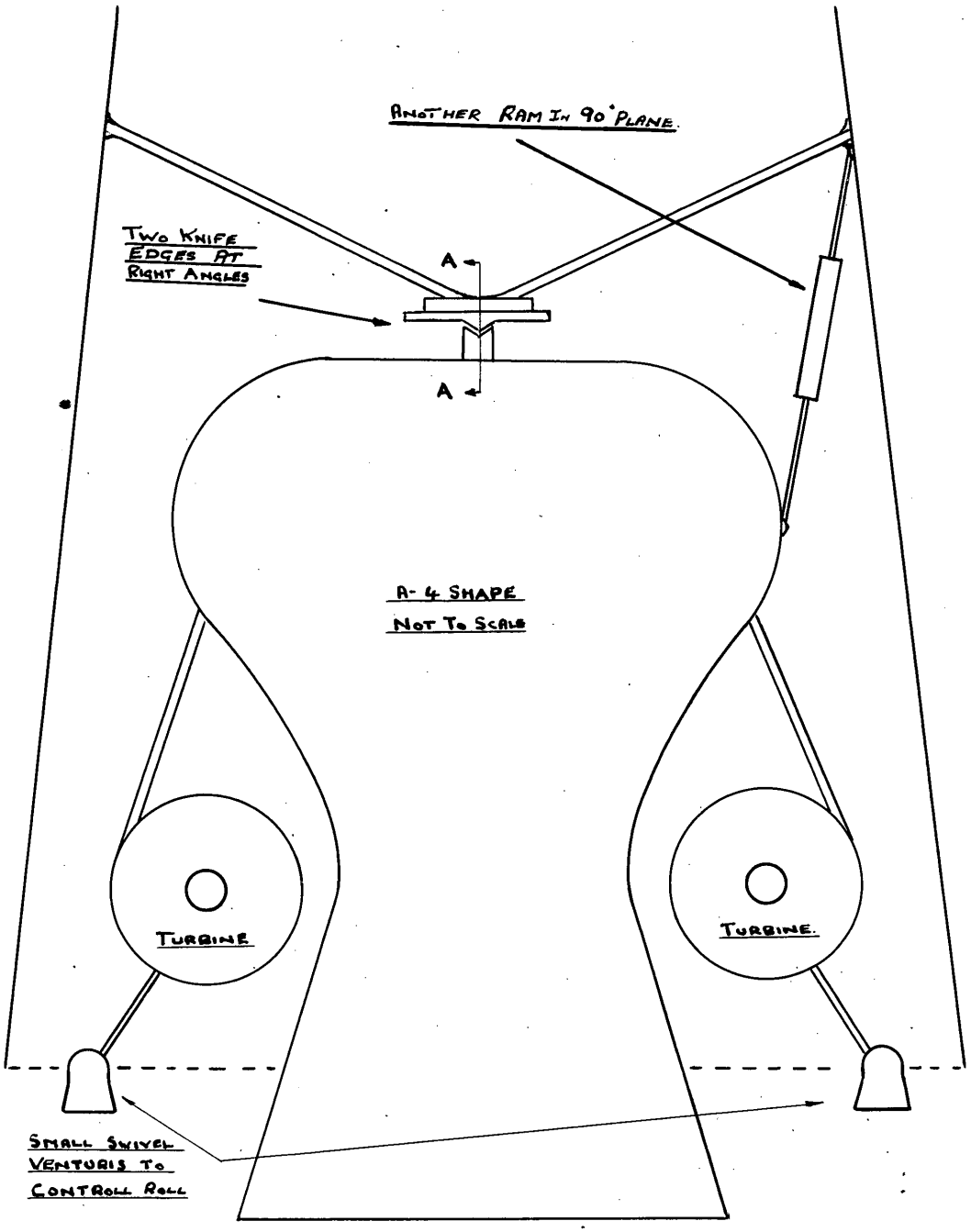
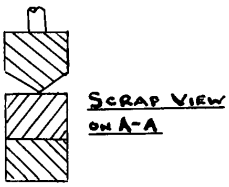


FIG 8





SCRAP VIEW ON A-A

FIG 9.